

Let Us Get Back to the Land—By Water

"A HOME!"
From all over the United States comes the cry.

"A home!"
Hundreds of thousands, in our big cities, are clamoring for the thing which comes second in man's needs—shelter.

Whether it be a flat or an entire residence, or merely a room in a lodging-house or hotel, it seems as though almost every other person to be met wants one.

The newspapers tell us of fat bribes offered to janitors for information as to who's going to vacate next, and when. We read, again, of grimly determined souls who each morning scan the obituary columns and then hurry to the kinsfolk of the late lamented with the hopefully-voiced query, "Are you going to move?" News comes of "tent towns" established by municipalities, of hundreds quartered in churches and armories, of still others sleeping even these cool nights in parks and public squares.

Why is all this?

There was little or no building of homes or apartments while we were at war, and while the population increased normally, shelter for it did not. That is the main reason for the overcrowding. Then thousands of country lads, enroute to training camps or overseas service, or on their way back therefrom, glimpsed for the first time the supposed fascinations of the big cities, and, once out of khaki, remained in the urban centers and did not return to the farm. That is another reason for the congestion.

Various other explanations might be made. But, disregarding them all, the outstanding fact would seem to be:

Our big cities are altogether too big for their own good—and are getting bigger.

"Stay here!"

From all over the land comes this appeal, too.

"Stay here!"

Scores of thousands of farmers, near the small towns and villages, are crying for men to help them produce that which comes first in humanity's needs—food.

As many small shop-keepers and small-scale producers of goods, in the hamlets, are pleading for assistance so that they may go on with their businesses.

But the little-community young people are not staying where they are asked to. The chronicles of the day record from the outlying districts the same sort of struggle for labor—the same bribery and all the rest of it—that appears in the cities' quest for shelter.

It is an undisputed fact that the United States, which should be the greatest food-producing country in the world, did not, this year, grow for its inhabitants much more than what they actually needed. The result was that prices were high; that those unable to pay them were undernourished; while those who were able to pay voiced bitter protest about the cost and added to the general atmosphere of discontent and unrest which pervades the world.

And why was this?

Partially, because the war-wave which took young men away from the farms and placed them in khaki had not yet ebbed them back again in anything like full numbers. Partially, because of those of them who renounced the open spaces after their first taste of city life. But mostly, perhaps, because of that growing dislike of the farm and especially of the country and the very small town, which seems to have been strengthening with each of the last few generations, and which has been responsible for a steady emigration cityward.

"There is nothing to hold us on the farm or in the small town," say the young people when asked, in the city, why they have come there. And apparently it is the fact that:

Our small towns are too small for their own good—and many of them are getting smaller.

WHAT is to be done about this state of affairs?

The answer, in a general way, is obvious: Relocate our population, or, anyhow, the increase of our population. Cut down the size of our great cities, which will speedily result in restoring disturbed conditions to normal. At all events, do not permit further increase in their size. Built up the hamlets and villages.

This sounds like a good sized order—and it is; but many students of the modern trend of things believe they see a way in which the plan, to a considerable extent, may be carried through.

The needs of the moment being elemental, the remedy which is suggested is also elemental. In fact it is one of the very elements.

Water!

If only a moderate proportion of the water-power which is now going to waste in almost every state of the Union were put to work, declare those who know the subject, there could be hundreds, if not thousands, of bustling industrial communities where now there are sleepy, half-deserted hamlets.

These new communities could be miniature cities. Being new, they could be laid out in pleasant fashion. Good wages could be paid. The small municipalities could be made so attractive that the native population would have no motive for seeking the more densely-crowded centers. In fact, just the reverse probably would be true. Tired city-workers would seek the smaller, newer, brighter places.

There would be in such towns a good percentage of the population not industrially inclined, from which the farmer could draw the help that he now needs. Or, better yet, agriculture and manufacture could be combined, as some forward-looking economists insist that inevitably it shall be.

The farmer, during his dull season, could work in the factory, thus increasing his own prosperity and interest in life. The factory-hand, during the busy periods of the agriculturist, could go out on the farm

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and help plant and garner the crops. These, being more plentiful than ever before (thanks to the industrialist's own assistance) would be cheaper than ever before, thus bringing down his cost of living. Besides all of which, both his interest and his health would be stimulated.

Of course, any power used for industrial development of small communities would bring about an identical result. Production actuated by steam engines, by internal combustion motors, or by gas or oil engines, would do just the same thing. But the up-to-date engineer sees electricity as the cheapest, best and cleanest source of energy, and the cheapest, best and cleanest mode of producing electricity is by means of the flowing streams which now ripple their way idly through the country.

The oldest parent of mechanical power is the water-wheel, which turned its creaking way ages before the Christian era, its flat paddles moved by the current of the little stream in which it was set. Who does not remember the venerable country grist-mill, with the water-wheel connected directly with a shaft which in turn moved the grindstone? It did not change much through the centuries.

The newest parent of mechanical power is, likewise, the water-wheel, but a very different sort of wheel. This is the fast spinning turbine, with cups or curved blades, instead of paddles, receiving its impetus not from the sluggish natural movement of a level stream, but from powerful volumes of water directed upon the cups or blades through narrow orifices, the fluid, seeking egress from a confining chamber of one sort or another, exerting tremendous strength in its effort at escape.

Above or alongside the turbine, a generator, hooked up with the water-wheel, takes this energy and turns it into electricity which the wires deliver to the machine in the factory or to the lamp or heater or fan or cooker in the home.

Of course, the development of hydro-electric power is not a thing of the last few months or years. It has been in use for several decades. But up to the present time the general practice has been to install great power stations, at enormous costs, for the use of railways or city lighting companies or the like. Only an extremely wealthy corporation could afford to take full advantage of nature's free gift. It did not seem to occur to the average small manufacturer or group of manufacturers that they, too, might share in the bounty. Nor did the engineers, apparently, have this class sympathetically in mind.

Today, however, the development of the machinery for producing electric power from moving water has progressed to such a stage that the equipment may be possessed easily enough by any manufacturer of moderate means, and certainly by any small group of manufacturers. And, once the turbines and generators

are in place, they require almost no attention at all. One small water-power set (if 150 horse-power may be called small) has just been developed at a cost which will place it within the reach of any village. And 150 horse-power means, usually, a factory with at least 150 employees. If light machinery is used, this power might take care of four or five times that number of machines.

This particular turbine and generator unit requires nothing more than an occasional inspection, it is so simple. But it is remarkably ingenious, as well. If its "load" is suddenly changed by reason of machinery being shut off, for instance, it automatically slows itself down by partially closing the gates through which the moving water enters upon the turbine blades.

The operating cost of a water-power plant is infinitesimal in comparison with either a gas, oil or steam engine. Professor Charles E. Lucke of Columbia University, in a table showing the comparative operating expenses of these three types of energizers, places water-power at \$1 a year against \$38.54 for gas, \$52.50 for steam and \$56.94 for oil. This is based on the unit of one kilowatt—the standard measurement of electrical energy.

THERE is not such a favorable difference, however, in the cost of installing water-power in comparison with the other forms of energy. At the same time, in Professor Lucke's table, he shows that where the total cost of a kilowatt produced by water, including plant installation, depreciation and all other items, was \$8.50 per year, the same unit produced by the gas engine cost \$65.54; by steam, \$69, and by oil engine \$78.64.

Not much is required for water-power. Any flowing stream will provide it; in fact Mr. Edison is working upon a scheme to hook up together the tiny energies that come from series of rivulets trickling through fields, though the value of that is probably well in the future. Of course, a stream with a deep descent, or coming from a height, is preferable. But that is not necessary. Any stream that moves can be dammed, its outlet confined to a narrow passage, and its water compelled to turn turbines before it gets back to its normal flow.

More than 50,000,000 horse-power is now going to waste in the United States, according to the latest government figures. An official survey, made recently, shows that the rivers and streams of the nation are capable of developing 60,713,200 H. P. Yet at the time of the survey there was only 5,321,699 H. P. in use, or 8.8 per cent of the total.

Michigan, more than any other state, has taken advantage of its opportunity for hydro-electric development. Of the 332,000 H. P. available within its borders, the Wolverine commonwealth at that time was using 213,111, or 64 per cent.

Michigan, likewise, will probably be the first state in which a demonstration will be given of the possibility of developing little hamlets into hustling miniature cities, for the largest manufacturing company there is installing water-power plants in several different sections, not only for the reason that they are cheaper to operate, but for the purpose of showing what can be done in the way of keeping people away from the already overcrowded population-centers, and also for the purpose of assisting farmers both by giving them work in the winter and workers at crop-times.

So firmly convinced of the efficiency and economy of water-power is this largest producing concern, that it will not, in future factories, use any other sort of machine-turning force, except in regions where hydro-electric energy cannot be had. Its example, followed in many other respects by large corporations, probably will be followed again in this plan.

New York State at the time of the survey had developed the greatest actual horse-power, 799,530. Its total resources are 4,242,000, the second greatest in the country. Washington, with a possible 9,990,000 H. P., is the richest state in water-power, though it has developed only 331,134, or 3.3 per cent. Wyoming, with a potential 1,470,000 H. P., and New Mexico, with a possible 497,000 H. P., are the most backward states in developing hydraulic energy, using only 2,544 H. P., or .2 per cent, and 552 H. P., or .1 per cent, respectively.

Neglect of this wonderful resource has been due, in the main, to the willingness of the manufacturer to trudge along in the old ruts made by his grandfather, and get his power from coal—the least efficient and most expensive of fuels.

But there has been another important reason—the lack of adequate laws whereby the federal government might grant permits to private corporations to install water-power plants on tidalwater streams, all of which are under national control. Of the country's total potential horse-power of 60,713,200, the government controls 46,913,200; and of this (owing to the difficulty of obtaining permits) only 3.9 per cent has been developed. Of the remainder, 13,800,000 H. P., which did not require federal consent for development, 25.2 per cent is in use. Legislative steps are being taken, however, to simplify the procedure of obtaining government permits for water-power sites, and soon, it is believed, this form of energy will be developed to the utmost.

Those who have been studying the human possibilities of the situation, as well as the material side, reason thus:

Producers of immense quantities of goods will find it to their economic advantage, as well as to the social advantage of the nation, to have at least part of their output manufactured in water-power communities, and if this plan is adopted generally it will mean, of course, a slowing-up in the growth of the great cities, a speeding-up of the growth of the smaller communities, and, in fact, the very re-distribution of population which is so gravely needed at this time.

Getting Ready for the Census

THE advance guard of the Census Bureau, whose workings it is expected will show that there are now 110,000,000 persons in the United States, has taken possession of about one-half of the temporary building occupied by the Aircraft Production section of the War Department during the war. It is the intention of the Aircraft section to surrender the entire building to the Census Bureau within a few months. The building, a full city block in its dimensions, offers commodious quarters for the rapidly expanding force of the Fourteenth Decennial Census. It likewise offers excellent facilities for the installation and operation of the many ingenious machines to be used by the bureau in tabulating the statistics which will be gathered by the enumerators during January, 1920. There will be 85,000 enumerators in the field.

Coal Found in Spitzbergen

NEWs of an important discovery of coal in Spitzbergen has been received in London. The Scottish Spitzbergen Syndicate sent an expedition to that country and the report is received from the leader that a party was landed north of Prince Charles Foreland with the result that the explorations bring out that the quantity of coal practically proved, over an area of only one square mile of this district, is 5,000,000 tons. Working facilities are reported to be excellent; there is deep water close inshore, and the seams can be attacked conveniently at a point near the beach. Of further interest it is mentioned that even the weathered outcrop coal burns well, and is being used by some of the miners in preference to their oil stoves.

Salesmen Taxed in New Zealand

ON ARRIVAL in New Zealand commercial travelers are required under the provisions of the Land Income Tax Act, to deposit with the collector of customs or commissioner of taxes an amount, usually ten pounds (\$48.67), to cover any income tax that may be payable on the business resulting from the visit. On which it is unlawful to carry on business. In arriving at the amount on which tax is levied, a percentage commencing at five per cent is taken of the total business resulting from the visit. The percentage varies according to the class of goods which the traveler is selling.